

Internet and Computer Usage: Comparisons among Metropolitan Centres, Coastal Regional Centres and Inland Regional Centres

Bruce Armstrong
Tim Comber
Southern Cross University

School of Multimedia and Information Technology
Southern Cross University
Coffs Harbour, NSW
Email: barmstro@scu.edu.au

Don Dingsdag
University of Western Sydney

School of Environment and Agriculture
University of Western Sydney
Richmond, NSW
Email: d.dingsdag@uws.edu.au

Gerry Fogarty
University of Southern Queensland

Department of Psychology
University of Southern Queensland
Toowoomba, QLD
Email: fogarty@usq.edu.au

Abstract

In this exploratory paper the authors compare Internet and computer usage data from the Basic Community Profiles (BCP) of the Australian Bureau of Statistics (2001d). The data is compiled from Census information collected in 2001. The comparisons examine data extracted from three metropolitan centres, three regional coastal centres, and three regional inland centres. The data collected by the ABS enabled comparison of computer usage by age categories and gender. Data on Internet usage enabled comparison by gender and usage location (work, home, school, etc). The picture of computer and Internet usage shown by the ABS data differs from that painted by some government sources, however, the differences could be due to varied samples and skewed distributions based predominantly on metropolitan based respondents.

Keywords

Basic Community Profile; Australian Bureau of Statistics, Internet usage, computer usage, ICT

INTRODUCTION

There is much discussion about the enabling characteristics of the Internet and Information Technologies (IT) and their ability to empower regional and rural communities (Kidman, 2003). Much of the research on community informatics focuses on the ability of communities to partake of the information revolution and benefit from targeted and strategic uptake of IT (Phillips & de Souza, 2002). However, to facilitate this uptake it is also vitally important that the very communities that are touted as benefiting do in fact have the necessary infrastructure and indicative uptake patterns to facilitate its use.

In Australia there is a long held belief that IT uptake in rural and regional communities lags behind that of their metropolitan counterparts (NOIE, 2002d; Phillips & de Souza, 2002). The data presented in this paper supports this notion and shows that IT uptake in regional and rural communities in Australia is significantly less than that of major metropolitan centres. However there are also instances where computer usage in particular age groups in the regional centres is significantly higher than the metropolitan centres. It is difficult to determine the reasons for these differences but the authors offer a number of observations that may offer explanations for the anomalies.

BASIC COMMUNITY PROFILES FROM THE 2001 AUSTRALIAN CENSUS

The 2001 Census conducted by the ABS¹ (ABS 2002g) included questions to each household about their occupants' use of computers and the Internet. This information was released as secondary data in the ABS's Basic Community Profiles (BCPs)² which are available for download as spreadsheets for AUSSTATS Subscribers from the ABS web site, www.abs.gov.au. Basic Community Profiles are available for towns/cities, Local Government Areas (LGAs), Urban Centres and Localities (UCLs) and statistical sub-regions (i.e. the Mid North Coast of NSW). Expanded community profiles providing more information have just been released, but too late for inclusion in this paper.

For this paper the authors selected BCPs from three NSW inland regional centres (Lismore, Armidale, Moree), three NSW coastal regional centres (Coffs Harbour, Port Macquarie, Tweed), and three major metropolitan centres (Brisbane, Sydney, Melbourne). The UCL summaries were used to provide a standardised basis for comparison. Three of these regional centres (Lismore, Coffs Harbour and Armidale) have universities which may have an influence on computer and Internet usage.

The BCPs include summaries of Census information including gender and age profiles, income, place of birth, ethnicity, religion, education level, etc. The information related to the use of information technology contains summaries of computer use by gender and age, and of Internet use by gender and the location where it is used i.e. at home and/or work and/or elsewhere. Details of the Information and Communications Technologies (ICT) usage of visitors (not regular members of the households) were also collected in the BCPs. However, these represented only a small proportion of the data (generally less than 1%) and were not included in the analyses that follow.

COMPUTER USAGE

A progress report on the uptake of information technology and advancement of the federal government's initiatives in relation to the information economy rated Australia as a world leader (NOIE, 2002a, p.24). It reported that as of September 2001:

- 67% of Australian households own or lease a computer;
- 52% of Australian households were online;
- 72% of Australians over 16 have Internet access; and
- 80% of 16 to 34 year olds and 68% of people 35 years and over have Internet access.

However, the 2001 Census data does not present such a positive picture. According to the Census, of the people in the coastal, inland and metropolitan UCLs:

- 40% use a computer at home;
- 37% were online;
- 36% over 16 use a computer at home; and
- 17% of 16 to 34 year olds use a computer at home.

	Coastal Regional	Inland Regional	Metropolitan	Total
0-9 yrs	3.94%	3.86%	4.49%	4.10%
10-14 yrs	4.49%	4.31%	4.80%	4.53%
15-19 yrs	3.95%	5.17%	5.10%	4.74%
20-24 yrs	2.23%	4.09%	4.22%	3.51%
25-34 yrs	5.26%	5.42%	8.13%	6.27%
35-44 yrs	7.00%	6.18%	8.27%	7.15%
45-54 yrs	5.93%	4.65%	6.15%	5.57%
55-64 yrs	3.35%	2.00%	2.64%	2.66%
65-74 yrs	1.65%	0.70%	0.88%	1.07%
75 yrs +	0.60%	0.21%	0.29%	0.37%
Total	38.40%	36.59%	44.97%	39.97%

Table 1: Average Percentage of People who use a Computer at Home

¹<http://www.abs.gov.au/websitedbs/D3110126.NSF/4fe99d527cb22dbcca256ace00039b49/83006a99024541f9ca256c3e0018a387!OpenDocument>

²<http://www.abs.gov.au/websitedbs/D3110124.NSF/24e5997b9bf2ef35ca2567fb00299c59/23862ac3b6b0ec1cca256c3a000442a5!OpenDocument>

A more detailed view can be seen in Table 1 which shows computer use data for coastal, inland and metropolitan urban centres. Given the thoroughness of the Census, it is felt that the figures from the BCP are more likely to represent the true state of affairs regarding the use of computers. It is clear from this table that the use of computers at home is not as high as reported by NOIE for any of the UCLs.

Figure 1 shows that between the ages of 0 to 14 and between 20 to 54 people in major metropolitan centres use computers more than people living in regional centres. However, people over 55 in the coastal urban centres use computers more than the people living in major metropolitan centres, while it is people living in inland urban centres between the ages of 15 and 34 who use computers more than people living in coastal urban centres.

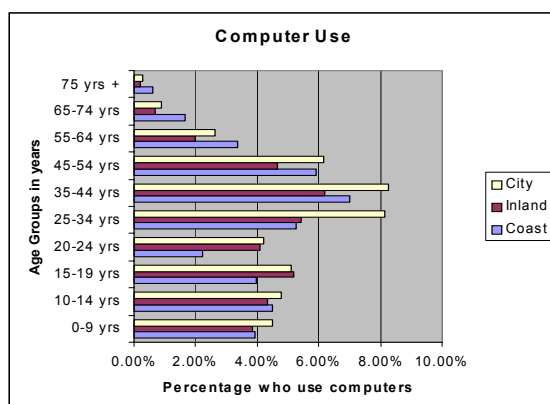


Figure 1: Comparison of Computer Use between City and Country Users

It could be claimed that the presence of University campuses in some of these regional centres could skew the results. Armidale, Coffs Harbour and Lismore all have a university campus. It is interesting to compare the differences in computer use on this basis (Figure 2). The presence of a university has the most marked effect on the 15-19 years olds who have a higher use (5.82%) than the city users (5.10%), followed by the 20-24 years olds (4.19%) who have almost the same proportion of users as the major metropolitan centres (4.22%) which also have university campuses.

The most likely explanation is that university students require computers in their studies and therefore a higher computer usage is reported in these centres. However, it appears that the existence of a university does not necessarily promote the wider use of computers in the community. It is also interesting to note that the proportion of users over 64 years of age is lowest in those centres which have a university campus.

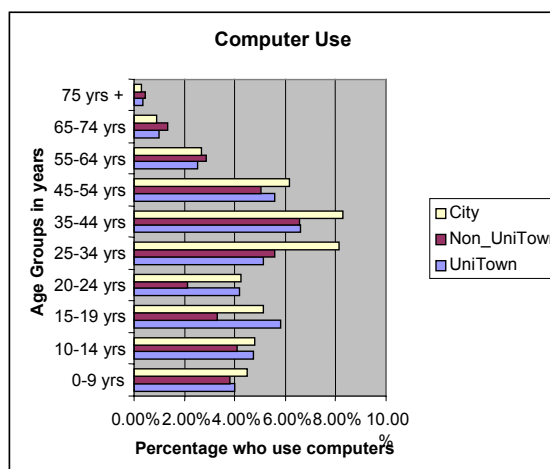


Figure 2: Comparison of Computer Use between Urban Centres with a University

It is clear from the data in Table 1 that people over 65 years of age are the least likely to use a home computer. The ABS (2000e) reported that in the 12 months to November 2000, as age increased, the likelihood of an adult being a computer or Internet user decreased with only very small differences between males and females. The

publication also identified that adults in metropolitan centres were more likely to have used a computer or accessed the Internet than adults in other areas.

This issue requires further investigation because the older members of society could gain many benefits from using computers and the Internet. Naughtin (2002) stated that the “well being, health status, independence and sense of security of frail older Australians ... can be significantly enhanced through the smart use of technologies” including the use of the Internet for health information. Other benefits that the elderly can gain from using computers and the Internet include online shopping, timely communications via email lists and newsgroups, personal communications using email and perhaps teleconferencing, and other technology related services including healthcare. These facilities could improve the quality of life of the elderly and do not rely on the mobility of participants.

INTERNET USAGE

Accessing the Internet requires some form of computer. Superficially it appears reasonable to expect that almost all people who use a computer at home would also access the Internet at home. This is not the case. An analysis of the ABS data shows that only 60% of people living in the inland regional centres, 69% of people living in the coastal regional centres and 70% of people living in the major metropolitan centres who used a computer at home also accessed the Internet at home. Thus up to 40% of the people who use a computer at home do not access the Internet using that computer.

This suggests that there must be barriers for some users accessing the Internet and that the problem is more pronounced amongst users living in inland centres. It is possible that these users do not access the Internet at home because they have access at work, Internet cafes, telecentres or community access sites, but the general trend is that people outside major metropolitan centres are less likely to use the Internet from home, work or any other site (2003b, 2002a). However it would be useful to find out why people who use a computer at home do not access the Internet as there appears to be the potential for ISPs to increase the number of customers just amongst computer owners.

The total number of ISPs is declining (ABS, 2003c, 2002e, 2001b) although the number of subscribers is climbing. The ABS (2002e) reports that the capital cities accounted for 73% of subscribers and 75% of the access lines at the end of March 2002. This trend resulted in an average of 9.3 subscribers per access line in the capital cities (average download of 320 Mbs) and 9.9 per line in other areas (average download of 205 Mbs).

The ABS (2003d) reported an 8% increase in Internet subscribers between March and September 2002 and a 112% increase in DSL connections over the same period, with capital cities now accounting for 81% of access lines and 78% of subscribers. The uptake of DSL probably is based on the unreliability and instability and slow download speed of ‘dial-up’ links, the availability of DSL at an increasing number of Telstra telephone exchanges and the lowering of prices for DSL connections.

The ABS (2000e) also reported that adults with higher incomes were more likely to use a computer or the Internet either at home or at work. They identified the largest differences existing between adults with incomes under \$40,000.

The key information related to Internet access is that regional centres access the Internet much less than their metropolitan counterparts and there is less infrastructure available in regional Australia to facilitate that access. While permanent connections using DSL technologies offer much faster downloads, the clear link between income and Internet access (ABS, 2000e) is going to impede its uptake in regional areas. Average incomes are lower and unemployment is higher in regional areas (i.e. Mid North Coast Region – 10.6%) than metropolitan areas (i.e. Inner Sydney – 3.4%) and uptake of ICT is also lower.

COMPUTER USAGE BY GENDER

The ABS statistics show that the proportion of women using computers is less than males for all regions however the greatest difference is in the major metropolitan centres (Table 2).

	Coast	Inland	City		Regional Uni	Regional Non-Uni
Males	40%	37%	48%		41.52%	35.98%
Females	37%	36%	42%		38.45%	34.23%

Table 2: Gender differences in computer use

A close examination of the data for each UCL, Figure 3, shows that for all UCLs except Moree, more males use computers than females, however the difference is never greater than 6%.

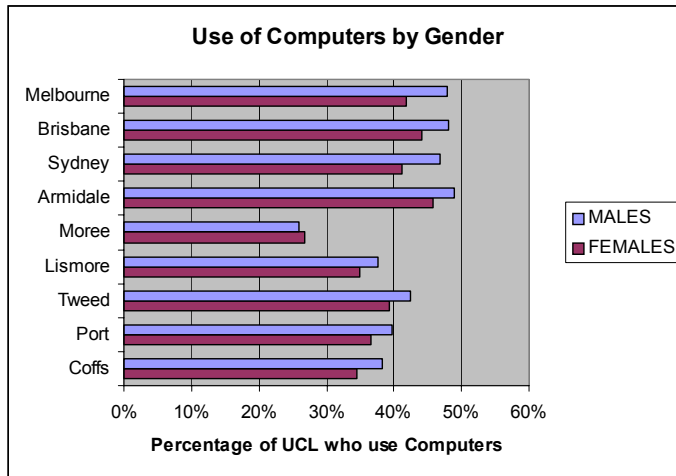


Figure 3: Gender differences in computer use for each UCL

Traditionally ICT has been seen as the domain of males. In particular the ICT industry is dominated by males. In a recent article in the Australian newspaper³ it was reported that female participation in the IT industry in Australia ranged between 20% and 30%. At the time of the 2001 Census 77% of computing professionals in NSW were male⁴. However, in terms of computer and internet use, the differences between genders are considerably slighter (2003b, 2000e)

GOVERNMENT INITIATIVES TO FACILITATE IT UPTAKE IN RURAL AND REGIONAL AUSTRALIA

The government has initiated numerous programs to improve ICT infrastructure, provide training in information technologies, encourage and promote e-commerce to businesses and household users, implement technologies appropriate to rural and remote communities' ICT needs, and provide communities with the opportunities to apply for funding to develop their own ICT solutions. However, Australia faces unique issues in attempting to deliver equitable ICT solutions. In the major metropolitan centres, ICT is highly developed and there is a much greater opportunity for households to utilize ICT infrastructure. In many cases, residents of the metropolitan centres enjoy cheaper access to ICT through economies of scale, with users in some rural and regional centres paying more for certain services (Broadband Advisory Group, 2003, p.45).

Phillips and de Souza (2002) noted that the Regional Telecommunications Inquiry Report states that the major impediment to equitable access to broadband services in rural and regional areas is the higher prices that users in those areas have to pay. The Broadband Advisory Group (2003, p.45) also identifies "*that broadband communications are becoming vital for the economic development of regional Australia*". This 'tyranny of distance' presents a dilemma for the federal government.

In rural and regional centres, the establishment of key infrastructure necessary to provide access to ICT equivalent to that of major metropolitan centres is not cost effective for service providers. For example, the uptake of broadband in metropolitan centres far outstrips the uptake in regional and rural centres. In many rural and regional centres, the population density does not warrant installation of multiple exchanges to ensure residents are within the required 3.5 kilometre radius for ADSL connectivity. In these areas broadband connectivity is an option, but too costly, especially given that the average income in most rural and regional centres is below that of residents in the major metropolitan centres. This leaves expansion and uptake of broadband in a bind where it is not cost-effective for providers to set up appropriate infrastructure and if they did the residents are less able to afford the cost of the services anyway.

The programs and initiatives listed above seem to be typical of government departments, and appear to be focussed on infrastructure and in particular the provision of higher bandwidth. In many cases the programs seem to be based on the view that ICT is a panacea for the economic and social disparities between regional and metropolitan centres. However, despite the number of programs and the cost of each, there are still significant discrepancies between regional and metropolitan uptake and usage of ICT.

³ <http://australianit.news.com.au/articles/0,7204,6459443%5e15841%5e%5enbv%5e,00.html>

⁴ <http://www.abs.gov.au/ausstats/abs2.nsf/0301e971e04f2be2ca256cb60006bf37/389f564f27cd7540ca256d080022636b!OpenDocument>

The information presented above seems to indicate a 'catch-22' situation for the federal government. On the one hand, a significant investment in ICT infrastructure may not create demand because the income and social structures of many regional centres are not indicative of the profile of users in metropolitan areas. As well, infrastructure developments may not be easily accessible to many residents of regional centres and the lack of economies of scale makes it an undesirable option for ISPs and ICT service providers.

CONCLUDING REMARKS

The data used to present the information in this paper is limited, yet it has enabled clear patterns of Internet and computer usage to be examined among a number of rural regional, coastal regional and metropolitan centres in Australia. Quite clearly Internet and computer usage is generally higher in major metropolitan centres than regional centres. In particular, the city with the densest population (Sydney), exhibits higher usage levels of the Internet and computers than all other centres. Sydney also exhibits a number of characteristics other than population density that could also be mitigating factors e.g. high average income, age distributions, household expenditure, public infrastructure, etc.

The paper indicates that there are two key factors that seem to impact on ICT and Internet uptake – income and infrastructure. The ABS clearly identified income as a factor that distinguishes the likelihood of Internet and computer use. The more highly developed infrastructure in capital cities was also more highly utilised. However, whether or not this is a key driver or simply a factor linked to population density and the higher levels of infrastructure and resulting economies of scale is unclear. Yet government expenditure seems to be focussed on programs and the development of infrastructure. There is no doubt that if the infrastructure is available it will be utilised by some users. However, it is still unclear whether the usage levels in regional centres warrant the high costs associated with implementing ICT infrastructure that provides parity with the metropolitan centres.

As stated above, this paper is an exploratory study that has attempted to profile the uptake of ICT and identify whether differences existed in the uptake between major metropolitan centres and regional centres. The paper clearly highlights that there are disparities and offers a few observations as to the possible causes of the divergence. In the next stage of research, the authors plan to broaden the study by examining a larger set of UCLs and exploring whether there are differences between States. Then it is intended to explore the programs, initiatives and other ICT related processes for those UCLs with the aim of attempting to identify the extent to which different programs impact of the uptake of ICT, particularly in regional and rural centres.

REFERENCES

- Naughtin, G. (2002) "Technology and its capacity to assist frail older people and their carers over the next 20 years", The Myer Foundation, <http://www.myerfoundation.org.au>
- Kidman, A. (2003) "Time for Technology", *Australian PC Authority*, Issue 66 – May, pages 115-122, AJB Publishing : Sydney.
- Mehlam, J. (2003) "At Your Service – Banking on Broadband", *Australian Technology and Business*, April, pages 127-130, ZDNet Publishing : Sydney.
- Australian Bureau of Statistics (2000a) "Australian Children Log On to Information Technology", *Media Release*, Publication No. 8147.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2000b) "Australian Just Love Surfing - ABS", *Media Release*, Publication No. 8147.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2000c) "Information Technology and Communications in Australia", *Australia Now : Year Book Australia*, Publication No. 5611.0-1999-2000, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2000d) "Online Shopping Blooms", *Media Release*, Publication No. 8147.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2000e) *Use of the Internet by Householders : Australia*, Publication No. 8147.0, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2001a) "Increasing Use of the Internet and Home Computers", *Media Release*, Publication No. 8147.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2001b) "Internet Subscribers Up, Slight Fall in Service Providers - ABS", *Media Release*, Publication No. 8153.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2001c) *Use of Information Technology on Farms, Australia*, Publication No. 8150.0 ABS, <http://www.abs.gov.au>.

- Australian Bureau of Statistics (2001d) *Census - Basic Community Profiles and Snapshots: Urban Centre/Locality*, http://www.abs.gov.au/ausstats/abs@census.nsf/Census_BCP_UCL_ViewTemplate?ReadForm&Expand=1
- Australian Bureau of Statistics (2002a) "Communications and Information Technology - Household Use of Information Technology", *Australia Now : Year Book Australia*, Publication No. 1301.0-2002, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2002b) *Government Use of Information Technology, Australia*, Publication No. 8119.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2002c) "Financial System Special Article - Information Technology and Telecommunications in Australia", *Australia Now : Year Book Australia*, Publication No. 5611.0-1999-2000, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2002d) *Information Technology, Australia*, Publication No. 8126.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2002e) "Number of Internet Service Providers Continues to Decrease", *Media Release*, Publication No. 8153.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2002f) "Preliminary Local Government Area (LGA) Populations (at 30 June 2002) and Final Median Ages (at 30 June 2001)", *Themes: Demography: Local Government (LGA) Populations for Each State and Territory*, Publication No. 1301.0-2002, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2002g) "Annual Report", Publication No. 1001.0- ABS 2001-02 , <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2003a) *Business Use of Information Technology, Australia*, Publication No. 8129.0 ABS, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2003b) "Household Use of Information Technology", *Australia Now : Year Book Australia*, Publication No. 1301.0-2003, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2003c) *Internet Activity : Australia*, Publication No. 8153.0, <http://www.abs.gov.au>.
- Australian Bureau of Statistics (2003d) "Permanent Internet Connections Accelerate", *Media Release*, Publication No. 8153.0 ABS, <http://www.abs.gov.au>.
- Broadband Advisory Group (2003) *Australia's Broadband Connectivity*, The Broadband Advisory Group's Report to Government, <http://www.noie.gov.au/projects/framework/Priorities/BAG.htm>, NOIE: Canberra.
- NOIE (2002a) *Advancing Australia: The Information Economy Progress Report 2002*, <http://www.noie.gov.au/projects/framework/Priorities/BAG.htm>, NOIE: Canberra.
- NOIE (2002b) *Broadband in Education: Availability, Issues and Initiatives*, <http://www.noie.gov.au/projects/framework/Priorities/BAG.htm>, NOIE: Canberra.
- NOIE (2002c) *Broadband in Health: Drivers, Impediments and Benefits*, <http://www.noie.gov.au/projects/framework/Priorities/BAG.htm>, NOIE: Canberra.
- NOIE (2002d) *Report on Broadband Advisory Group Consultative Forums*, <http://www.noie.gov.au/projects/framework/Priorities/BAG.htm>, NOIE: Canberra.
- Harris, D., Potter, M. (2002) *Regional Business Development Analysis*, NFF Submission to Regional Business Development, http://www.rbda.gov.au/new/submissions/Submission_169.doc.
- Phillips, G., de Souza, C. (2002) "Regional Telecommunications Inquiry Report", FOCUS: Telecommunications, November, <http://www.aar.com.au>, Sydney.

COPYRIGHT

Bruce Armstrong, Tim Comber, Don Dingsdag, Gerry Fogarty © 2002. The authors assign to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the authors.